

**FLASHLIGHT ADAPTED FOR USE WITH A PLASTIC BEVERAGE BOTTLE  
TO FORM A SIGNALING TORCH**

**BACKGROUND OF THE INVENTION**

**1. Field of the Invention**

5       The invention relates to a flashlight, more particularly to a flashlight adapted for use with a plastic beverage bottle to form a signaling torch.

**2. Description of the Related Art**

10       Generally, a conventional flashlight is used for lighting and warning purposes. Furthermore, if plastic beverage bottles, such as polyethyleneterephthalate (PET) bottles, can be used for other purposes, recycling efficiency can be promoted.

15       Therefore, the object of the present invention is to provide a flashlight adapted for use with a plastic beverage bottle to form a signaling torch.

**SUMMARY OF THE INVENTION**

20       According to the present invention, there is provided a flashlight adapted for use with a plastic beverage bottle that includes a light-transmissible bottle body formed with an externally threaded mouth. The flashlight comprises:

25       a barrel having a front barrel portion that defines a front receiving space, and a rear barrel portion that is connected to the front barrel portion and that defines a rear receiving space adapted for receiving a battery unit;

a reflector disposed in the front receiving space of the front barrel portion;

a lamp disposed in the reflector;

5 a conductor unit disposed in the barrel and adapted to establish electrical connection between the lamp and the battery unit;

a coupling sleeve having a front coupling section formed with an internally threaded surface that is adapted to engage the externally threaded mouth of the bottle body, a rear coupling section mounted securely on the front barrel portion, and an intermediate section interconnecting the front and rear coupling sections; and

15 a lens piece mounted in the intermediate section of the coupling sleeve.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference to the accompanying drawings, of which:

20 Figure 1 is a schematic view showing the preferred embodiment of a flashlight for use with a plastic beverage bottle according to the present invention;

Figure 2 is an exploded view showing the preferred embodiment; and

25 Figure 3 is a schematic sectional view showing the preferred embodiment.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to Figures 1 to 3, the preferred embodiment of a flashlight 1 according to the present invention is shown to be adapted for use with a plastic beverage bottle 3, such as a polyethleneterephthalate (PET) bottle. The typical plastic beverage bottle 3 includes a light-transmissible bottle body 30 formed with an externally threaded mouth 31. The flashlight 1 includes a barrel 11, a reflector 12, a lamp 13, a conductor unit, a coupling sleeve 15, and a lens piece 16.

The barrel 11 has a front barrel portion 111 that defines a front receiving space 116, and a rear barrel portion 112 that is connected to the front barrel portion 111 and that defines a rear receiving space 118 adapted for receiving a battery unit 2, as shown in Figure 3. In this embodiment, the front barrel portion 111 has a front end formed with an externally threaded surface 117. The rear barrel portion 112 has a rear end provided with a hanger ring 113 thereon. The battery unit 2 has a first battery terminal 21 and a second battery terminal 22 opposite to the first battery terminal 21, as best shown in Figure 3.

The reflector 12 is disposed in the front receiving space 116 of the front barrel portion 111. In this embodiment, the reflector 12 has a tubular conducting portion 122, and a diverging reflecting portion 121 connected to the tubular conducting portion 122. In

this embodiment, the diverging reflecting portion 121 has an inner surface formed with a silver-plating layer (not shown).

5 The lamp 13 is disposed in the reflector 12. In this embodiment, the lamp 13 has an inner lamp terminal 131 that is adapted to contact electrically the first battery terminal 21, and an outer lamp terminal 132 that surrounds the inner lamp terminal 131 and that engages and contacts electrically the tubular conducting  
10 portion 122 of the reflector 12, as shown in Figure 3.

The conductor unit is disposed in the barrel 11 and is adapted to establish electrical connection between the lamp 13 and the battery unit 2. In this embodiment, the conductor unit includes a conducting plate 14, a  
15 conducting strip 17, and a switch member 115, as shown in Figure 3. The conducting plate 14, which is made of metal, is mounted in the front receiving space 116 of the front barrel portion 111, and is formed with a mounting hole 141. The tubular conducting portion 122  
20 of the reflector 12 extends through the mounting hole 141 and contacts electrically the conducting plate 14. The conducting strip 17 has a first strip portion 171 connected electrically to the conducting plate 14, and a second strip portion 172 adapted to connect  
25 electrically with the second battery terminal 22. The switch member 115 is mounted on the barrel 11, is connected electrically to the first and second strip

portions 171, 172 of the conducting strip 17, and is operable so as to make or break electrical connection between the first and second strip portions 171, 172.

The coupling sleeve 15 has a front coupling section 152 formed with an internally threaded surface 1521 that is adapted to engage the externally threaded mouth 31 of the bottle body 30, a rear coupling section 154 formed with an internally threaded surface 1541 and mounted threadedly on the front end of the front barrel portion 111 via engagement between the externally threaded surface 117 of the front end of the front barrel portion 111 and the internally threaded surface 1541 of the rear coupling section 154, and an intermediate section 153 interconnecting the front and rear coupling sections 152, 154. In this embodiment, the intermediate section 153 has an inner diameter less than those of the front and rear coupling sections 152, 154, and defines a lens mounting hole 157 that has a large-diameter hole portion 156 proximate to the rear coupling section 154, and a small-diameter hole portion 155 proximate to the front coupling section 152, as best shown in Figure 2.

The lens piece 16 is mounted in the intermediate section 153 of the coupling sleeve 15. In this embodiment, the lens piece is disposed in the large-diameter hole portion 156 of the lens mounting hole 157 in the intermediate section 153. It is noted that the front barrel portion 111 has an inner diameter

substantially smaller than a diameter of the lens piece 16 so as to prevent movement of the lens piece 16 away from the large-diameter hole portion 156 of the lens mounting hole 157 in the intermediate section 153. The  
5 diverging reflecting portion 121 of the reflector 12 can direct light radiated by the lamp 13 toward the lens piece 16. In this embodiment, the lens piece 16 is a colorless condenser lens. Alternatively, a colored condenser lens, such as a red, blue, green or purple  
10 lens piece, can be used in this embodiment. Moreover, the lens piece 16 is preferably formed with light guiding portions 161, 162 on one side thereof for light convergence purposes.

Due to the combination of the flashlight 1 and the  
15 plastic beverage bottle 3, light generated by the flashlight 1 passes through the colored bottle body 30 so that the aforesaid combination can serve as a signaling torch.

While the present invention has been described in  
20 connection with what is considered the most practical and preferred embodiment, it is understood that this invention is not limited to the disclosed embodiment but is intended to cover various arrangements included within the spirit and scope of the broadest  
25 interpretation so as to encompass all such modifications and equivalent arrangements.